

# SEMINÁRIO DO GRUPO DE FÍSICA MATEMÁTICA

**Dia 28 de março (terça-feira), às 14h00, sala 6.2.33**

## Recent advances in positivity questions for trace class operators

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**Abstract:** Trace class operators play an important role not only in functional analysis but also in related theories such as quantum mechanics, where one identifies “mixed states” with positive trace class operators having trace equal to one. As is “well-known” it is the positivity of such operators which poses a difficult mathematical problem: we are still lacking complete conditions on the Weyl symbol of a trace class operators allowing to decide whether this operator is positive. In this talk, we review the so-called Kastler-Louprias-MiracleSole (KLM) conditions which have been known since the 1980s and complement them with some new results. We briefly mention possible, but controversial, cosmological consequences for the early universe just after the Big Bang.